

New Decapod Records from the Hawaiian Islands (Crustacea, Decapoda)¹

RICHARD H. TITGEN²

ABSTRACT: Twenty-two new decapod species records, nine new generic records, and two new familial records are reported for the Hawaiian Islands. Most represent widely distributed Pacific or Indo-Pacific species, though one is an undescribed species of gnathophyllid shrimp and three are also known to occur in the Atlantic Ocean.

THE NUMBER of decapod species known from the Hawaiian Islands has gradually increased as material from new habitats has been collected, and as other material has been more thoroughly examined. This report presents twenty-two species previously unknown in the Hawaiian Islands. Of these, nine are also new generic records, and two are new familial records. The material reported herein is maintained at the Bernice P. Bishop Museum (BPBM), Honolulu, Hawaii.

FAMILY BRESILIIDAE

Discias exul Kemp

Discias exul Kemp, 1920: 138, text-figs. 1-3, pl. 8; Kensley, 1983: 3 (key), 13, figs. 10a-p, 11a, b.

MATERIAL EXAMINED: Two specimens, BPBM S10630, Oahu, Kahe Pt., coll. S. Coles, 5 August 1977, HECO 6B# 5; one specimen, BPBM S10631, Oahu, Kahe Pt., coll. S. Coles, 5 August 1977, HECO 7C# 4.

DISTRIBUTION: Andaman Islands, South Africa, and Australia.

REMARKS: This is the first record of a species in the family Bresiliidae to be reported from Hawaiian waters.

FAMILY PALAEMONIDAE

Fennera chacei Holthuis

Fennera chacei Holthuis, 1951: 171, pl. 54 figs. a-p; Bruce, 1983: 196 (key), 202.

MATERIAL EXAMINED: 39 lots, BPBM S10632, Oahu, Kahe Pt., coll. S. Coles, 1977.

DISTRIBUTION: From the western Indian Ocean to Australia, the Hawaiian Islands, and the eastern Pacific.

REMARKS: *Fennera chacei* is a small pontonine shrimp that is generally associated with corals in the genus *Pocillopora* Lamarck, 1816 (Bruce, 1976a).

Leandrites cyrtorhynchus Fujino and Miyake
Leandrites cyrtorhynchus Fujino and Miyake, 1969: 143, figs. 1-3; Monod, 1976: 11, figs. 42-45, 53-57.

MATERIAL EXAMINED: 1 ♀ (ovig.), BPBM S10068, Oahu, Makua, coll. W. Sugiyama, 1 May 1982, depth 15 m, in small hole at the base of a barren rock slope or dropoff; 1 specimen, BPBM S10069, Oahu, Nanakuli, coll. D. Yamaguchi, 4 May 1982, depth 15 m, solid rock cave at base of a rock slope.

DISTRIBUTION: *Leandrites cyrtorhynchus* has been reported previously from Japan and New Caledonia, and Bishop Museum has specimens from the Hawaiian Islands and Enewetak Atoll (BPBM S10091).

REMARKS: *Leandrites cyrtorhynchus* is a cleaner shrimp that is usually active at night. In Hawaii it is known to be associated with the following fish: *Arothron hispidus* (Linnaeus, 1758) (BPBM Photos 1299, 1299a), *Acanthurus leucopareius* (Jenkins, 1903) (BPBM Photo 1266), *Scarus perspicillatus* Steindachner, 1879 (BPBM Photos 1263, 1264), *Scarus*

¹ Manuscript accepted April 1987.

² Bernice P. Bishop Museum, P.O. Box 19000-A, Honolulu, Hawaii 96817.

rubroviolaceus Bleeker, 1847 (BPBM Photo 1265), and *Naso lituratus* (Bloch and Schneider, 1801) (BPBM Photo 1245).

FAMILY GNATHOPHYLLIDAE

Gnathophyllum sp.

MATERIAL EXAMINED: 1 ♀ (ovig.), BPBM S10621, Oahu Makaha, coll. S. Jazwinski, 18 March 1985, depth 12 m, in reef crevice, at night; 1 ♀, BPBM S9735, Hawaii, Puako, coll. S. Johnson, 29 May 1981, depth 10 m, in cave, at night.

REMARKS: This is a new species of gnathophyllid shrimp (Titgen, in press) that is cryptic and seldom seen. However, it has been known and photographed around the Hawaiian Islands for some time (BPBM Photos 221–223, 1292, 1293), although only two specimens have been collected. Most sightings have occurred at night in caves, at a depth of about 10 m.

FAMILY HIPPOLYTIDAE

Thor amboinensis (de Man)

Hippolyte amboinensis de Man, 1888: 535.

Thor amboinensis: Miyake and Hayashi, 1966: 152, figs. 5, 6, 8b; Bruce, 1976b: 51, fig. 22C.

MATERIAL EXAMINED: Three specimens, BPBM S8482, Oahu, Kaneohe Bay, coll. D. Sarver, October 1973, associated with sea anemone *Antheopsis papillosa* (Kwietniewski, 1898).

DISTRIBUTION: From the western Indian Ocean to Palau, Japan, and the Hawaiian Islands, and also known from the western Atlantic.

REMARKS: This widely distributed Indo-Pacific species is known to be associated with a wide variety of coelenterates, including sea anemones, corals, and hydrocorals (Patton, 1966; Bruce, 1976a, 1976b; Suzuki and Hayashi, 1977).

Thor paschalis (Heller)

Hippolyte paschalis Heller, 1861: 276, pl. 3 fig. 24.

Thor paschalis: Bruce, 1976b: 50, fig. 22B.

MATERIAL EXAMINED: Four specimens, BPBM S8479, Maui, Kahului coll. D. M. Devaney, January 1973; one specimen, BPBM S8768, Oahu, Kaaawa, coll. C. H. Edmondson, November 1929.

DISTRIBUTION: From the western Indian Ocean to Indonesia, the Mariana Islands, and the Hawaiian Islands.

REMARKS: *Thor paschalis* is usually associated with sea grass beds (Bruce, 1976b).

FAMILY PROCESSIDAE

Processa coutierei Nobili

Processa Coutierei Nobili, 1904: 234.

Processa coutierei: Hayashi, 1975: 95, figs. 17, 18a–i.

MATERIAL EXAMINED: One specimen, BPBM S10635, Oahu, Kahe Pt., coll. S. Coles, 13 July 1977, HECO 6B #2; two specimens, BPBM S10636, Oahu, Kahe Pt., coll. S. Coles, 15 June 1976, HECO 6B #1.

DISTRIBUTION: East Africa and the Red Sea.

FAMILY PANDALIDAE

Stylopandalus richardi Coutière

Pandalus (Stylopandalus) Richardi Coutière, 1905: 1115.

Stylopandalus richardi: Chace, 1985: 136, figs. 62a–p.

MATERIAL EXAMINED: 2 ♀♀ (ovig.), BPBM S6159, 18°58'N, 168°27'W, Fish & Wildlife Service, 11 March 1951, Lot I–25, HMS 8–105–16; one specimen, BPBM S6186, 19°43'N, 156°12.2'W, Fish & Wildlife Service, 15 August 1953, Lot II–3–1, HMS 21–35.

REMARKS: *Stylopandalus richardi* is found from a depth of 3600 meters to the surface, and has been collected in all major tropical and temperate seas (Chace, 1985).

FAMILY SCYLLARIDAE

Scyllarus ?cultrifer (Ortmann)

Arctus cultrifer Ortmann, 1897: 272.

Scyllarus cultrifer: Holthuis, 1946: 93, pl. 8 figs. c–e.

MATERIAL EXAMINED: 1 ♀ (ovig.), BPBM S10633, Northwestern Hawaiian Islands, Brooks Bank, coll. C. Sordin, 24 May 1980, depth 125 m, regurgitated by a grouper, *Epinephelus quernus*.

DISTRIBUTION: East Africa, the Philippines, Japan, and the Hawaiian Islands.

Scyllarus vitiensis (Dana)

Arctus Vitiensis Dana, 1852: 19.

MATERIAL EXAMINED: 1 ♂, BPBM S9738, Hawaii, Puako, coll. S. Johnson, 19 May 1981, depth 10 m, about 2200 hrs., in cave; 1 ♂, 1 ♀, BPBM S8853, Hawaii, Puako, coll. S. Jazwinski and T. Hayes, depth 7.6 m, in cave at night, on sides and roof; 1 ♀ (ovig.), BPBM S8540, Oahu, off Kepuhi Point (Makaha), coll. J. Earle, June 1975, depth ca. 21.3 m, base of dropoff ledge, near dendrophyllid coral, night dive; 1 ♀, BPBM S10634, Oahu, Wai-anae, coll. S. Jazwinski, 30 July 1984.

DISTRIBUTION: Fiji, Amboina, Pajunga Island.

FAMILY DIOGENIDAE

Calcinus argus Wooster

Calcinus argus Wooster, 1984: 133, figs. 3A–E.

MATERIAL EXAMINED: 1 ♂, 1 ♀ (ovig.), BPBM S10629, Oahu, Kahe Pt., coll. R. H. Titgen, 4 May 1985, coral, rock and sand, depth 3–6 m.

DISTRIBUTION: Mariana Islands and the Hawaiian Islands.

REMARKS: *Calcinus argus* is immediately recognizable by its unique color pattern. It is the only described *Calcinus* species with the first three pereopods a dark maroon color with white spots (Wooster, 1984).

FAMILY GALATHEIDAE

Munida aff. *heteracantha* Ortmann

Munida heteracantha Ortmann, 1892: 255, pl. 11 fig. 12.

MATERIAL EXAMINED: 1 ♀, 1 juv., BPBM S10289, Hawaii, 12.9 km NE of Kauhola Pt., 20°20.7'N, 155°47.5'W, *Proteus* Sta. 103, 5 September 1971, depth 460 m, rocky coral bottom.

DISTRIBUTION: Bonin Islands and Japan.

REMARKS: Baba (1969) lists the depth range for *Munida heteracantha* as 30–350 m. The Hawaiian specimens were collected at a depth of 460 m.

Munida normani Henderson

Munida Normani Henderson, 1885: 408.

MATERIAL EXAMINED: 1 ♂, BPBM S7990, Molokai Channel, depth 365–460 m, *Pele* Expedition, coll. M. King, 10 October 1966, tangle net; 1 ♂, 3 ♀♀, BPBM S10288, Hawaii, 12.9 km NE of Kauhola Pt., 20°20.7'N, 155°47.5'W, *Proteus* Sta. 103, 5 September 1971, depth 460 m, rocky coral bottom.

DISTRIBUTION: Fiji and the Hawaiian Islands.

FAMILY CHIROSTYLIDAE

Eumunida picta Smith

Eumunida picta Smith, 1883: 44, pl. 2 fig. 2, pl. 3 figs. 6–10, pl. 4 figs. 1–3a.

MATERIAL EXAMINED: 1 ♀, BPBM S10282, Oahu, Kaiwi Channel, 10 km off Makapuu Pt., November 1972, depth 365 m, precious coral beds; 2 ♂♂, BPBM S10283, Oahu, Kaiwi Channel, off Makapuu Pt., coll. B. Madden, February 1975, depth 365 m, associate with precious coral (*Corallium*) colony.

REMARKS: *Eumunida picta* is known primarily from the Atlantic Ocean.

FAMILY ALBUNEIDAE

Albunea thurstoni Henderson

Albunea Thurstoni Henderson, 1893: 409, pl. 38 figs. 13–15.

Albunea thurstoni: Gordon, 1938: 187, figs. 3a, i, k; Serène and Umali, 1965: 87, 89, 90 (key), 99–102, 105, figs. 8, 9a, pl. 1 fig. 3, pl. 2 fig. 3, pl. 3 fig. 2, pl. 4 fig. 3, pl. 5 figs. 1, 1a; Serène, 1973: 263 (key).

MATERIAL EXAMINED: 1 ♂, BPBM S5343, Oahu, off Waikiki, coll. Smith and Allen, 23 May 1948, dredged at 23 m; 1 ♀, BPBM S5348, Oahu, off Waikiki, coll. Allen and Smith, 30 May 1948, dredged at 6 m; 1 ♀, BPBM S6775, Oahu, Kahana Bay, *Pele* Expedition, 25 July 1959, depth 46–64 m; 1 ♀, BPBM S6776, Oahu, off Sand Island, *Pele* Expedition, 17 July 1959, 293–46 m; 1 ♀, BPBM S6777, Oahu, Diamond Head, *Pele* Expedition, 4 September 1959, depth 46–82 m; one specimen (dry, damaged), BPBM S7806, Oahu, Kaneohe Bay, 23 June 1924, dredged at 6 m.

DISTRIBUTION: India, the Red Sea, and the Hawaiian Islands.

REMARKS: In addition to *Albunea thurstoni*, *A. speciosa* Dana, 1852, is also known from the Hawaiian Islands. The two species can be separated by the shape of the eye stalks and the number of spines on the anterolateral border of the carapace. The eye stalks of *A. speciosa* are relatively long and gradually taper distally, with the external lateral border slightly concave, whereas, in *A. thurstoni* the eye stalks are short with the external lateral border slightly convex. There are 11–12 spines on the anterolateral border of *A. speciosa*, and 8–9 on *A. thurstoni*.

FAMILY DROMIIDAE

Lasiodromia sp.

MATERIAL EXAMINED: 1 ♂, BPBM S10296, Oahu, Pokai Bay, 2.4–3.2 km out, *Pele* Expedition, 31 July 1959, haul 195, depth 26–30 m, bottom with sand, coral, algae, and ammunition.

REMARKS: *Lasiodromia* Alcock, 1901, is a rather uncommon genus of dromiid crabs. At present there are two described species, *Lasiodromia coppingeri* (Miers, 1884), known from the Indian Ocean, and *L. unidentata* Ihle, 1913, known from Timor Island and Japan (Sakai, 1976).

FAMILY HOMOLIDAE

Homola ikedai Sakai

Homola ikedai Sakai, 1979: 4, text-figs. 1b, 3c, Frontispiece fig. 1; Guinot and Richer de Forges, 1981c: 534, text-figs. 2A, 2A1, pl. 2 figs. 2–2b, pl. 8 figs. 1, 1a.
? *Homola dickinsoni* Eldredge, 1980: 274, figs. 2, 3.

MATERIAL EXAMINED: 1 ♂, 1 ♀, BPBM S10637, Oahu, 4 km off Buoy 1, Pearl Harbor Entrance, coll. E. Chave, 27 February 1976, *Easy Rider*, depth 338 m, in shrimp trap.

DISTRIBUTION: Japan, the Loyalty Islands, the Hawaiian Islands, and possibly Guam.

REMARKS: The holotype of *Homola dickinsoni* Eldredge, 1980 (BPBM S8595), closely fits the description and illustrations of *H. ikedai*. However, specimens should be compared to determine if they are in fact the same species.

Hypsophrys williamsi Takeda

Hypsophrys williamsi Takeda, 1980: 282, figs. 2, 3.

MATERIAL EXAMINED: 1 ♂, 2 ♀♀, BPBM S10614, Hawaii, Kona, August 1984, depth about 610 m, caught in *Heterocarpus* trap; 1 ♂, 1 ♀ (ovig.), BPBM S10628, Hawaiian Islands, 4–5 October 1980, depth about 366 m, caught in shrimp trap.

DISTRIBUTION: Japan and the Hawaiian Islands.

Paromola spinimana Griffin

Paromola spinimana Griffin, 1965: 87, text-figs. 1–8, pls. 1, 2; Sakai, 1976: 41, pl. 11.
Homola japonica: Clarke, 1972: 313 [part].

MATERIAL EXAMINED: 1 ♀, BPBM S7866, Oahu, Barbers Pt., coll. T. Clarke, 28–29 October 1969, depth 183 m, gill net.

DISTRIBUTION: New Zealand, Japan, and the Hawaiian Islands.

REMARKS: Except for this specimen, the only species in the genus *Paromola* Wood-Mason, 1891, reported from the Hawaiian Islands is *P. japonica* Parisi, 1915. Most of Clarke's (1972) observations and collected specimens were probably of *P. japonica*, which is common in deeper Hawaiian waters. However, the single specimen from his study that he deposited in the Bishop Museum is *P. spinimana*.

FAMILY RANINIDAE

Notosceles viaderi Ward

Notosceles viaderi Ward 1942: 47, pl. 4 figs. 5, 6; Serène and Umali, 1972: 36; Crosnier, 1976: 239, fig. 6a–h.

Notosceles sp.: Clarke, 1972: 313, 314, 316.

MATERIAL EXAMINED: 1 ♂, BPBM S10609, Northwestern Hawaiian Islands, French Frigate Shoals, South Bank, *Easy Rider*, 15 March 1979, depth 128 m, specimen regurgitated on deck by a grouper, *Epinephelus guerus*; 1 ♀, BPBM S6795, Hawaiian Islands, Oahu, off Sand Island, *Pele* Expedition, 18 July 1959, dredged at 305–110 m.

DISTRIBUTION: Mauritius, La Reunion, and the Hawaiian Islands.

FAMILY GERYONIDAE

Progeryon sp.

MATERIAL EXAMINED: 1 ♀, BPBM S10626, Oahu, 4.8 km off Pearl Harbor, coll. E. Chave, 18 July 1977, *Easy Rider*, depth 420 m, sandy bottom; 1 ♂, 3 ♀♀, BPBM S10612, Hawaii, Kona, August 1984, depth about 610 m, caught in *Heterocarpus* trap; 1 ♂, BPBM S10627, Northwestern Hawaiian Islands, Midway Island, coll. P. Struhsaker, November 1980, *Easy Rider II* Cruise 80–02, Sta. 54; 1 ♂, BPBM S8563, Northwestern Hawaiian Islands, Nihoa Island, NMFS Sta. 1, depth 440 m.

REMARKS: There are three described species in the genus *Progeryon* Bouvier, 1922, in the Indo-Pacific. *Progeryon guinotae* Crosnier, 1976, is known from the Indian Ocean and questionably from the Emperor Seamount Chain, which is located northwest of the Hawaiian Islands (Sakai, 1978; Guinot and Richer de Forges, 1981a). The other two species, *P. vaubani* Guinot and Richer de Forges, 1981, and *P. mararae* Guinot and Richer de Forges, 1981, were described from the Loyalty Islands and the Tuamotu Archipelago, respectively. The Hawaiian specimens seem to correspond to the species reported by Sakai (1978) from the Emperor Seamount Chain.

FAMILY GONEPLACIDAE

Beuroisia major (Sakai)

Neopilumnoplax major Sakai, 1978: 8, text-figs. 16, 17, pl. 2 fig. A.

Beuroisia major: Guinot and Richer de Forges, 1981b: 233, 236, 237, 242, 244, figs. 5A, B, 7H, pl. 4 figs. 4–5a, pl. 5 figs. 2, 3.

MATERIAL EXAMINED: 1 ♂, BPBM S10624, Hawaii, Kawaihae, 1970, depth 393 m; 1 ♀, BPBM S8560, Northwestern Hawaiian Islands, 40 km W of Maro Reef, 25°22'N, 170°58'W, *Townsend Cromwell* Station TC-78-03 Stn. 14, 17 August 1978, depth 420 m, trap.

DISTRIBUTION: Emperor Sea Mount Chain and the Hawaiian Islands.

REMARKS: Both specimens with pedunculate barnacles, *Trilasmis* (*Poecilasma*) *kaempheri* (Darwin, 1851), primarily on the pereopods, but also on the anterolateral border of the female specimen.

ACKNOWLEDGMENTS

Over the years a number of people have generously given their time and expertise to identify specimens for the Bernice P. Bishop Museum. I would like to acknowledge the following people for having identified some of the material used in this report: A. J. Bruce, A. Fielding, J. Haig, K.-I. Hayashi, and L. B. Holthuis.

LITERATURE CITED

- BABA, K. 1969. Chirostylids and galatheids from dredgings and trawlings operated in the East China Sea by the Japanese Fisheries Research Vessel "Kaiyo Maru" in 1967. *Occas. Pap. Zool. Lab. Fac. Agric. Kyushu Univ.* 2(3):41–57, figs. 1–8.
- BRUCE, A. J. 1976a. Coral reef Caridea and "Commensalism." *Micronesica* 12(1):83–98, figs. 1, 2.
- . 1976b. Shrimps from Kenya. *Zool. Verh. (Leiden)* 145:1–72, figs. 1–23.
- . 1983. The pontonine shrimp fauna

- of Australia. Aust. Mus. Mem. 18:195–218.
- CHACE, F. A., Jr. 1985. The caridean shrimps (Crustacea: Decapoda) of the *Albatross* Philippine Expedition, 1907–1910, part 3: families Thalassocarididae and Pandalidae. *Smithson. Contrib. Zool.* 411:i–iv + 1–143, figs. 1–62.
- CLARKE, T. A. 1972. Collections and submarine observations of deep benthic fishes and decapod Crustacea in Hawaii. *Pac. Sci.* 26(3):310–317.
- COUTIÈRE, H. 1905. Sur quelques Crustacés provenant des campagnes de la *Princesse-Alice* (filet à grande ouverture). *C. R. Acad. Sci.* 140:1113–1115.
- CROSNIER, A. 1976. Données sur les crustacés décapodes capturés par M. Paul Guézé à l'île de la Réunion lors d'essais de pêche en eau profonde. *Trav. Doc. ORSTOM* 47: 225–256, text-figs. 1–9, pls. 1, 2.
- DANA, J. D. 1852. *Conspectus Crustaceorum quae in Orbis Terrarum circumnavigatione, Carolo Wilkes e Classe Reipublicae Fæderatae Duce, lexit et descripsit.* *Macroura*. *Proc. Acad. Nat. Sci. Phila.* 6:10–28.
- DEMAN, J. G. 1888. Bericht über die im indischen Archipel von Dr. J. Brock gesammelten Decapoden und Stomatopoden. *Arch. Naturgesch.* 53(1):215–600, pls. 7–22, 22a.
- ELDRIDGE, L. G. 1980. Two species of *Homola* (Dromiacea, Homolidae) from Guam. *Micronesica* 16(2):271–277, figs. 1–3.
- FUJINO, T., and S. MIYAKE. 1969. On two new species of palaemonid shrimps from Tanabe Bay, Kii Peninsula, Japan (Crustacea, Decapoda, Palaemonidae). *Publ. Seto Mar. Biol. Lab.* 17(3):143–154, figs. 1–5.
- GORDON, I. 1938. A comparison of the two genera *Albunea* and *Lepidopa* (Crustacea, Anomura), with description of a new species from Singapore. *Bull. Raffles Mus.* 14:186–197, figs. 1–5, pl. 29.
- GRIFFIN, D. J. G. 1965. A new species of *Paromola* (Crustacea, Decapoda, Thelxiopidae) from New Zealand. *Trans. Roy. Soc. N.Z.* 7(4):85–91, text-figs. 1–8, pls. 1, 2.
- GUINOT, D., and B. RICHER DE FORGES. 1981a. Crabs de profondeur, nouveaux ou rares, de l'Indo-Pacifique (Crustacea, Decapoda, Brachyura). *Bull. Mus. Natl. Hist. Nat.* (4e) 2:1113–1153, text-figs. 1–3, pls. 1–7.
- . 1981b. Crabs de profondeur, nouveaux ou rares, de l'Indo-Pacifique (Crustacea, Decapoda, Brachyura). *Bull. Mus. Natl. Hist. Nat.* (4e) 3:227–260, text-figs. 4–12.
- . 1981c. Homolidae, rares ou nouveaux, de l'Indo-Pacifique (Crustacea, Decapoda, Brachyura). *Bull. Mus. Natl. Hist. Nat.* (4e) 3:523–581, text-figs. 1–7, pls. 1–8.
- HAYASHI, K.-I. 1975. The Indo-West Pacific Processidae (Crustacea, Decapoda, Caridea). *J. Shimonoseki Univ. Fish.* 24(1):47–145, figs. 1–35.
- HELLER, C. 1861. Beiträge zur crustaceen-fauna des Rothen Meeres. *Sitzungsber. Akad. Wiss. Wien.* 44:241–295, pls. 1–3.
- HENDERSON, J. R. 1885. Diagnoses of the new species of Galatheidea collected during the *Challenger* expedition. *Ann. Mag. Nat. Hist.* (5) 16:407–421.
- . 1893. A contribution to Indian carcinology. *Trans. Linn. Soc. Lond.* (2) 5:325–458, pls. 36–40.
- HOLTHUIS, L. B. 1946. Biological results of the Snellius Expedition. XIV. The Decapoda Macrura of the Snellius Expedition. I. The Stenopodidae, Nephropsidae, Scyllaridae and Palinuridae. *Temminckia* 7:1–178, text-figs. 1, 2, pls. 1–11.
- . 1951. A general revision of the Palaemonidae (Crustacea, Decapoda, Natantia) of the Americas. I. The subfamilies Euryrhynchinae and Pontoniinae. *Allan Hancock Found. Publ. Occas. Pap.* 11:1–332, pls. 1–63.
- KEMP, S. 1920. XVII. Notes on Crustacea Decapoda in the Indian Museum. XIV. On the occurrence of the caridean genus *Discias* in Indian waters. *Rec. Indian Mus.* 19:137–143, figs. 1–3.
- KENSLEY, B. 1983. New records of bresiliid shrimp from Australia, South Africa, Caribbean, and Gulf of Mexico (Decapoda: Natantia: Caridea). *Smithson. Contrib. Zool.* 394:1–31, figs. 1–22.
- MIYAKE, S., and K.-I. HAYASHI. 1966. Some hippolytid shrimps living in coral reefs of the West Pacific. *J. Fac. Agric. Kyushu Univ.* 14(1):143–160, figs. 1–10.
- MONOD, TH. 1976. Sur quelques Natantia

- (Crust. Décapodes) de Nouméa (Nouvelle Calédonie). Cah. Pac. 19: 7–28, figs. 1–57.
- NOBILI, G. 1904. Diagnoses préliminaires de vingt-huit espèces nouvelles de Stomatopodes et Décapodes Macroures de la Mer Rouge. Bull. Mus. Hist. Nat. 10: 228–238.
- ORTMANN, A. 1892. Die Decapoden-Krebse des Strassburger Museums. IV. Die Abtheilungen Galatheidea und Paguridea. Zool. Jahrb., Syst. 6: 241–326, pls. 11, 12.
- . 1897. Carcinologische Studien. Zool. Jahrb., Syst. 10: 258–372, pl. 17.
- PATTON, W. K. 1966. Decapod Crustacea commensal with Queensland branching corals. Crustaceana 10(3): 271–295, figs. 1–3.
- SAKAI, T. 1976. Crabs of Japan and the adjacent seas. Kodansha Ltd., Tokyo. 3 volumes, xxix + 773 + 461 pp., 379 text-figs., 251 pls.
- . 1978. Decapod Crustacea from the Emperor Seamount Chain. Researches on Crustacea, No. 8: 1–39, text-figs. 1–27, pls. 1–4.
- . 1979. Descriptions of three new species of crabs of the family Homolidae from Japan. Researches on Crustacea, No. 9: 1–12, text-figs. 1–3, frontispiece figs. 1, 2.
- SERÈNE, R. 1973. A new species of Decapoda Hippidea: *Albunea mariellae* nov. sp. from the Banda Sea. Crustaceana 24(3): 261–264, pls. 1, 2.
- SERÈNE, R., and A. F. UMALI. 1965. A review of Philippine Albuneidae, with descriptions of two new species. Philipp. J. Sci. 94(1): 87–116, text-figs. 1–12, pls. 1–6.
- . 1972. The family Raninidae and other new and rare species of brachyuran decapods from the Philippines and adjacent regions. Philipp. J. Sci. 99(1–2): 21–105, text-figs. 1–131, pls. 1–9.
- SMITH, S. I. 1883. Preliminary report on the Brachyura and Anomura dredged in deep water off the south coast of New England by the United States Fish Commission in 1880, 1881, and 1882. Proc. U.S. Nat. Mus. 6(1–4): 1–57, pls. 1–6.
- SUZUKI, K., and K-I. Hayashi. 1977. Five caridean shrimps associated with sea anemones in central Japan. Publ. Seto Mar. Biol. Lab. 24(1/3): 193–208, text-figs. 1–5, pls. 1, 2.
- TAKEDA, M. 1980. A small collection of crabs from the Kyushu-Palau submarine ridge, with a description of a new species of the Homolidae. Micronesica 16(2): 279–287, figs. 1–3.
- WARD, M. 1942. A new genus and eight new species of Brachyura from Mauritius and the Chagos Archipelago. Mauritius Inst. Bull. 2(2): 39–48, pls. 2–4.
- WOOSTER, D. S. 1984. The genus *Calcinus* (Paguridea, Diogenidae) from the Mariana Islands including three new species. Micronesica 18(2): 121–162, figs. 1–5.